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PACKARD-BELL MODEL 48B

Circa 1938

SOUTHERN CALIFORNIA ANTIQUE RADIO SOCIETY

Incorporated, Non-profit Organization

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SCARS is a non-profit organization. Its purpose is to preserve the history of wireless communication by encouraging the acquisition, preservation and exhibition of antique wireless and radio apparatus and publications pertaining to its history and development.

SCARS promotes contacts social through meetings held four times a year at various locations in Southern California. Featured at these meetings are contests, swap sessions and talks by members and guests on subjects of interest to collectors.

The club publishes quarterly the *California Antique Radio Gazette* which features news of club activities, hints on restoration, and advertisement of radio related items available for sale or trade. It is furnished free to all members. Ads are printed free for members. SCARS assumes no responsibility for the condition of items sold at swap meets or through *Gazette* ads.

Membership is open to anyone having a genuine interest in preserving the equipment and history of early wireless and radio equipment. Dues are \$10.00 per calendar year.

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The opinions expressed in the *Gazette* are those of the authors and may not reflect the opinions of the editors or the SCARS membership.



PRESIDENT'S MESSAGE

By Mike Adams

The Top Ten. To some that means a list of hit records or videotapes, the best dressed people of the year or even *Time* magazine's top ten news stories. But to us in the radio collecting fraternity, our "top ten" is a list of best-selling books for and about our hobby. I'm talking about those publications that keep us together; books that tell us how to restore, how to identify and how much to pay for the antique radios in our collections. All the research, writing, re-writing and distribution involved makes publishing a book a major accomplishment.

So we can be proud, as the leading West Coast historical radio group, to have a number of successful authors in our membership. In fact, according to information published by Antique Electronic Supply, half of last year's top ten best-selling books on antique radio were written by active SCARS members.

Vintage Radio and *A Flick of the Switch* by Morgan McMahon have been best sellers for years. Last year George Fathauer Sr. and Robert Grinder made the charts with *The Radio Collector's Directory and Price Guide*. *The Radio Horn Speaker Encyclopedia* by Floyd Paul was released in 1987 and it too went into the top ten. And the recently released *Radios: The Golden Age* by Philip Collins was featured in the *Los Angeles Times Magazine* in November 1987. It is already a big seller.

So there you have it — the "hits" of the antique radio collecting community, and all written by members of your club — the Southern California Antique Radio Society.

MAY LUNCHEON

A gourmet basket lunch is being planned for the May meeting. The lunch will be made available around noon before the auction is held. The luncheon will consist of an excellent sandwich, a salad, and a beverage. The cost will be \$5.50 per person.

All luncheon orders must be received by Mary Curry by May 14. **Please mail in luncheon orders now!** See Mary's address on the inside front cover of this *Gazette*.

NEXT MEETING

MAY 21, 1988

LOCKHEED EMPLOYEE
RECREATION CLUB

2814 Empire Ave.

Burbank, CA

Co-Sponsored by AWA

7-10:30 A.M. Swap Meet

10:30-11 Contest

11:00 Business Meeting

11:30 Lunch Break

12 Noon Auction

Look for the summer meeting, August 20, in Burbank. Note it on your calendar.

BURBANK MEETINGS

Our host, Bill Welsh, of Lockheed, indicates the parking lot will be open about 7 A.M. on the Saturday mornings of the meeting dates.

NOTICE

Only SCARS members may sell at SCARS meets.

PACKARD-BELL CO., MANUFACTURERS

THE FIRST DOZEN YEARS

By FLOYD A. PAUL

INTRODUCTION

The Packard-Bell story is about the company, its products, and one of its co-founders, Herb Bell. Herb, single handedly, made the company a success. Information for this story came from a number of sources and all are referenced. The paragraph topics that follow are:

Foreward, by Ralph A. Lamm

Herb Bell's background

Packard-Bell Co., Mfgs.

Early Key People

Toward WW-II

Postlude

Packard-Bell Reminisces

FOREWARD

By Ralph Lamm

Southern California, and more specifically Los Angeles, was recognized as the midget radio capitol of the world in the 1929 and 1930 era. In the early 1930's many new Los Angeles radio manufacturers came into existence. Some succeeded and others failed. An outstanding example of success was Packard-Bell which started business during the depression years.

One had to admire the firm, not only for its very attractive and good performing products, but also the Packard-Bell organization itself. Management and operation were held in high esteem by all who dealt with them. Many top executives emerged from their experiences with Packard-Bell. Its radios were of good design and sound construction. Packard-Bell could always be depended upon to keep up with technical and design progress, to which designers included innovations of their own.

The Company's excellent sales organization with its tight but fair policies and distribution network were unbelievably effective. As a result, the dealers were extremely loyal, which presumably was the reason for a substantial amount of Packard-Bell's success.

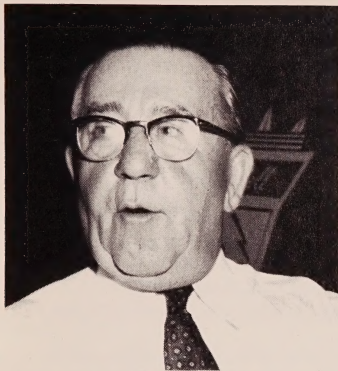
Packard-Bell did much in elevating the stature of West Coast radio manufacturing and sales in the 1930's and 1940's. Actually, in later years, Packard-Bell sales penetrated the Mid-Western and some Eastern markets, bringing recognition to Los Angeles manufacturers as suppliers of quality radios. Packard-Bell had much to do with the continued success of the electronics business in the West.

HERB BELL'S BACKGROUND

By Ken Johnson¹

Herb Bell was born Herbert Anthony Zwiebel. His parents grew up in Germany near a town called Baden Baden in a region between France and Germany called Alsace-Lorraine. Herb was raised in Burlington, near Milwaukee, Wisconsin and he went into the tire recapping business in Omaha, Nebraska, with his brother Arthur in the early 1920's. He was married and divorced in Omaha.

Herb came to California in the mid-twenties and started a partnership in Los Angeles called Bell-Neff, circa 1925-1926. One of their products was a coin operated radio for hotels. Little is known of the Bell-Neff venture but it was apparently short lived.



Herb Bell

In late 1926 Herb joined up with a Mr. Jackson. Jackson-Bell did a big business in midget (mantel) radios in 1929-1932. By the spring of 1933 the company went into receivership. (The Jackson-Bell (J-B) story is another article.)

PACKARD-BELL CO. Manufacturers

**The First Dozen Years
(1933 to WW-II)**

After the demise of Jackson-Bell, Herb Bell found a new partner, Mr. Leon S. Packard, who came from Seattle and San Francisco, where he had been in the radio industry many years. Jointly they formed a company called Packard-Bell (P-B) and were located at 1320 South Grand in Los Angeles. Packard-Bell opened its doors for business in September 1933 according to an article in *Technician* magazine of September 1934, in which it was noted, "Packard-Bell has been in business one year and is making its own coils, chassis and cabinets."

The author believes the Model 35A, which had a tube line up of a 57, 58, 56, 2A5, and an 80, was the

PACKARD-BELL ENDS THEIR FIRST YEAR

The Packard-Bell Company, manufacturers of radio receivers, celebrates its first anniversary this month also. This company is formed of Mr. A. H. Bell, formerly president of the Jackson Bell Company, and Mr. L. S. Packard, who came here from Seattle and San Francisco where he had been in the radio industry for many years.

Located at 1318 South Grand, this company first opened its doors September 1, 1933, and has steadily increased its scope of activities ever since, until it now manufactures a complete line of radio receivers. This company also manufactures its own coils, chassis and cabinets. We congratulate them on their first birthday.

From Technician, September 1934

earliest Packard-Bell made. John F. Rider's *Perpetual Trouble Shooter's Manual's* schematic diagram of the Model 35A shows no tone control. This fact and the fact that Model 35A has the same tube complement as one of J-B's last known models suggests direct lineage from J-B design. Both the last known set made by J-B and the first known set made by P-B had low rectangular silhouette cabinet designs and were not cathedral in design.

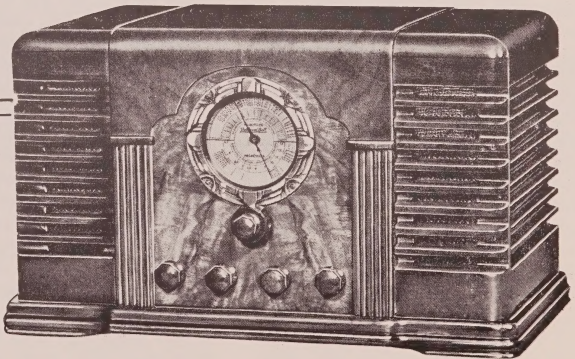
Ken Johnson told of some financial assistance the Packard-Bell company received in the early days. Herb Bell had a discussion with Ben Platt, owner of the Platt Music Co. in Los Angeles, who had been in business since 1905. Herb offered to build the Platt Music Co. a six tube superheterodyne radio set for the price of a five tube set. Platt Music Co. was interested and Ben indicated they would place an order for some one thousand sets. Herb said to Ben, "Ben, I need an advance of money up front." Mr. Platt reportedly wrote a check to Packard-Bell so the transaction could be consummated.

PACKARD-BELLModel **47**

A new seven tube receiver . . . employing genuine metal tubes . . . that invites the critical inspection of all who understand radio . . . Several of the newer features are:

1. **SENSIVITY** . . . *Actually exceeds one micro-volt per meter.*
2. **SELECTIVITY** . . . *Plus or minus 10 K.C. on production sets. (Every set oscilloscope checked.)*
3. **FREQUENCY STABILITY** . . . *A higher degree than ever before attained on production models. An original Packard Bell development.*
4. **TONE** . . . *A new degree of realism.*
5. **A.V.C.** . . . *Something actually new. Another exclusive Packard Bell development . . . ideal for metal tubes.*
6. **SHORT WAVE PERFORMANCE** . . . *A new type high impedance R.F. stage — another exclusive development — plus perfected tracking, resulting in remarkable sensitivity. Watch for this important new idea.*
7. **FREQUENCY RANGE** . . . *540 to 18,500 Kc with no skip.*
8. **PRICE** . . . *In keeping with Packard Bell policy of more for your money.*

Licensed
by
RCA
—
Passed
by the
National
Board
of
Fire
Underwriters

**PACKARD - BELL CO.**

LOS ANGELES

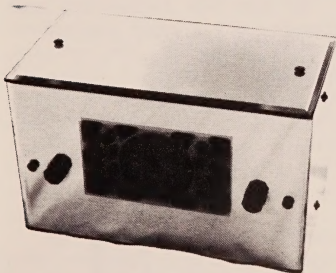
• SAN FRANCISCO

• SEATTLE

• PHOENIX

A full page Packard-Bell advertisement in the *Technician* magazine of November 1934 announced a new Model 36 which was a six tube superheterodyne. The set has several features: (1) foreign and American broadcast, (2) fully illuminated airplane dial with the more popular stations calibrated directly on the dial, (3) full automatic volume control, and a tone control, RCA licensed, and it sold at a list price of \$29.95. (Author's note: It is believed this set was the one made for Platt Music Co.)

Other early model sets which have schematic diagrams in early Rider's Manuals, are the 25 (an auto set), 34, 35, 45M, 65, 76, and 86. The 45M, 76, and 86 models have a Rider's schematic date of June 8, 1934.



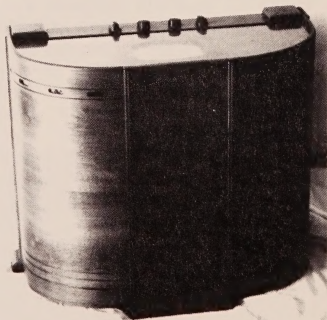
Model 35 mirrored set, owned by Ted Flynn, Vice President of Sales at Packard-Bell in 1967

Jean Pierre Gleis² remembers Herb saying his mother (Mrs. Zwiebel) couldn't read the numbers on the station dials of early P-B sets and couldn't he do something about it? Hence, Herb had his dials made with station call letters clearly printed across the dial. "Stationized dials" became a standard trade mark of P-B radios.

The new line of radio products had considerable eye appeal and quality. Herb's efforts proved successful and from inception until World War II the company did well and the company prospered. However, in the early months Mr. Packard didn't seem to have faith in the company and after some months asked to be bought out. He left the company about eighteen months after its creation. (According to Jean Gleis, Herb was in the process of increasing set production from twenty-five to fifty sets per day.) A March 1935 *Technician* announcement noted, "Mr. L. S. Packard formerly with Packard-Bell is now connected with Herbert H. Horn Company."

EARLY KEY PEOPLE

Early key people of the Packard-Bell organization were: Allen Ellsworth (chief engineer), Joe M. Spain (sales manager), and Howard D. Thomas Jr. (whose father, Howard D. Thomas Sr. was a distributor of Jackson-Bell radios, and according to Jean Pierre Gleis, was an original investment backer of Packard-Bell).



Packard-Bell Model 46B, Armchair Radio, 1937

Joe Spain had previously been with the West Coast RCA-Victor organization. He had performed an independent survey of several West Coast radio product lines, and Packard-Bell products came out consistently high for value and worth. Joe went to Herb and asked to go to work for him. Allen Ellsworth retired from the company in the mid-late '40's, and Eddie Uecke replaced him. Charlie Nichols had been an engineering designer for the Jackson-Bell company and had worked for Herb in the 1929-1932 era. Charlie was with P-B by the spring of 1935 as a service engineer. Gene O'Sullivan was service manager in 1935. Al Lombardo was in charge of manufacturing all metal products including the tool and die department.

Herb's four brothers participated in the Packard-Bell business and some, like Herb, also shortened their names from Zwiebel to Bell. Ken Johnson recalls Herb was the oldest. The second brother, Arthur, was a lumber king and knew the lumber business. Albert (also known as "Slip") was a salesman. Elmer ("Bub") W. was a designer, and used the name Zwiebel. Willard handled the cabinet production end of the business.



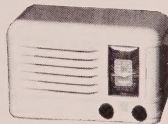
Packard-Bell Model 65A, 1940-41

TOWARD WORLD WAR II

The company had chassis assembly lines at Gilfillan Brothers, and final assembly was at the South Grand Avenue plant. (By the mid-thirties most larger Los Angeles radio manufacturers were assembling their chassis at the Gilfillan plant so as to become licensed under RCA, Hazeltine and Latour.)

During World War II Packard-Bell performed prime contract military equipment work. All prewar distributors of the P-B radio line were invited to be limited partners during WW II and most partners made a good deal of money according to Ken Johnson. Among the several items made for the armed forces was an IFF (Identify Friend or Foe) Transponder Unit, APX-6, according to Robert Goad.³

By this time Packard-Bell was operating out of larger quarters on 1115 S. Hope St. The company received the Army and Navy "E" award (E for excellence). In July of 1943 Packard-Bell moved to even larger quarters at 3443 Wilshire Blvd. in the E. L. Cord building.



Packard-Bell Model 5FP, 1946, Courtesy Morgan McMahon

POSTLUDE -- LUXURY LIVING

Herb enjoyed the niceties of luxury living in the forties, fifties and sixties, and among his hobbies were boats. According to Jean Pierre Gleis, his first boat was a thirty-five foot Chris Craft cabin craft, followed

by a fifty-two foot Chris Craft with triple screws, and then he bought a ninety-three foot yacht which had been the flagship of the Sunkist Tuna Fleet. He lengthened the yacht to ninety-eight feet so he could have a card room on the stern of the ship.

These boats were all called "Five Bells" and were anchored in Newport Harbor, California. The author had the privilege of being invited by a close real estate friend (Henry Schnathorst, who had been asked by a Packard-Bell distributor, Art Hast, to bring a friend and come for a two day cruise to Avalon on Catalina Island). One of the prerequisites, I was told, was that all passengers must play a card game called "Wahoo." Being a bit of a card buff in my younger days, I accepted and joined the trip on September 23, 1962.

Wahoo is a six card stud poker game. It is played with two cards down, four cards up, and each player's low hole card is wild. Herb would draw chips from the pot every deal. This pot collection was used to buy the passengers a nice supper when we dined in Avalon the first night.

The ninety-eight foot "Five Bells" was later given to the Scripps Institute of Oceanography.

Packard-Bell was sold to Tele-dyne in 1971 and the company continued making radios as well as televisions and stereos. Herb died in the early 1970's.

PACKARD-BELL REMINISCENSES

Roy Culver⁴ went to work for Gilfillan as a receiver assembler in 1936 and left in 1939. During the first two years Roy worked on Gilfillan radios on the Gilfillan assembly line. During his last year of

employment Roy spent much time on the Packard-Bell assembly line, which was parallel and adjacent to the Gilfillan line on the first floor. Even though he worked on Packard-Bell sets on a Packard-Bell assembly bench, his paycheck came from Gilfillan.

Roy remembers working on three different P-B chassis at various times. The chassis were a Model 5, Model 48, and the Model 120. During assembly of the Model 120 chassis, which were made in batches of 100 at a time, Roy remembers the set assemblers being paid \$1.00 per hour instead of fifty cents per hour as on sets with fewer tubes. The Model 120 chassis went into a console and was a ten tube, top of the line set. He remembers the rf subchassis on the Model 48B was called a "brain" and he assembled parts on it. He says there was one long assembly line (ten men and about fifty feet of bench top) on the Packard-Bell line. Daily capacity of the assembly line was about 400 chassis when the Model 5 chassis was being assembled.

Carl Duffy⁵ hired into Packard-Bell in September of 1939 as a shipping clerk. The plant was at 1320 S. Grand in Los Angeles and Carl remembers there may have been fifteen employees working there when he started. He hired several people, including Bill Dey.

Chassis were being assembled at the Gilfillan plant and then trucked to the S. Grand plant in 1939 and 1940 for assembly into cabinets. In November 1940 the Gilfillan factory was destroyed by a fire. Herb Bell was negotiating a license agreement with RCA and following the Gilfillan fire, P-B brought all assembly work into their own plant. At about the

same time P-B needed to expand its facilities and moved to 1115-1119 S. Hope St., Los Angeles, where the P-B chassis were made and final assembly took place.

Bill Dey⁶ went to work at Packard-Bell on S. Grand Ave. in late 1939 as an assembler. He took the chassis which came from Gilfillan and installed it and the speaker into a plastic or wood cabinet. Bill remembers that each wood cabinet cost some \$3.00 more than the plastic. Twelve to fifteen assemblers would unstack twenty to thirty chassis and place them on a table top. The assemblers would move around to pick up cabinets and then return to a chassis for installation and final check out. There was an "air" test to see that the set played. The sets were then put into cardboard boxes and moved to a shipping department. Bill recalls most of the packaged sets were pre sold and they went right out the door. Bill's initial salary with overtime was \$18 to \$20 per week.

When WW II occurred, the government shut down all civilian radio production. The government did give several weeks notice and stated that any partially built chassis (as of the cut-off date) would be allowed to be completed in the coming months. Bill remembers that in those few weeks he and all other available help worked long second shift hours preparing partially built chassis to meet the deadline. He remembers stacks and stacks of partially completed chassis being stored in the plant.

Raymond Tyndale⁷ joined Packard-Bell in March 1942 and worked there six months before going into the service. His job was that of a tester and he worked in a small semi sound-proof room with test equip-

ment. There were three other testers at the 1115 S. Hope St. plant. Completed chassis came to him from the assembly line and his job was to make the sets operate. Ray adjusted and checked the sets for performance. If a circuit was miswired, a tube was bad, or a part was bad, he fixed it. Some of the larger sets he worked on, such as the Model 120 or 130, sometimes had several problems. Ray recalls specifically a Model B-19 (19 tubes) which was a top of the line set. He believes only a few hundred chassis were made. Perhaps only two sets an hour would go through his hands. The operating sets would go to a cabinet installation work area. Ray, (like Bill Dey's recall) remembers during his last few weeks of employment that he was called upon to work evening shifts to prepare partially assembled chassis to be stored for future completion so as to meet the government's deadline for semi-completed chassis.

1. Ken Johnson joined Packard-Bell in 1945 as an accountant and stayed with the company twenty-eight years. He is semi retired and living in Westlake Village, California. Ken retired as V.P. and General Manager of the Consumer Products Division, and President of the Packard-Bell Sales Corp. The author met Ken at a Radio Old Timer's Club luncheon in 1987.

2. Jean Pierre Gleis worked at Packard-Bell from 1945 until he retired as Vice President of Manufacturing in 1968 and then became a Packard-Bell distributor. Jean still does consulting work and lives in Newport Beach, California.

3. Robert Goad, Tampa, Florida --- Packard-Bell employee 1959-1964.

4. Roy Culver, W6MMF (since 1935), retired and living in Glendale, California.

5. Carl Duffy left Packard-Bell in 1965 as Vice President and Manager of the Service Division. He lives in Mercer Island, Washington.

6. Bill Dey, Van Nuys, California.

7. Raymond Tyndale, Van Nuys, California.

PACKARD-BELL

WHO'S COLLECTING

By Bob Zelenack

Once upon a time long ago I met Grant Manning who mentioned he and some friends were going to form an antique radio collectors club. The idea sounded interesting at the time, but I didn't give it too much thought because I was involved with Amateur Radio Operating (My call is W6OOQ).

I told my wife Nancy about this club (now known as SCARS) and then forgot about it. Nancy didn't. About a week later she bought a Jackson-Bell Model 62 at a local garage sale for \$8.00. Well, that was it! I was now an antique radio collector!!

I have been involved with radio and electronics since 1963 when I received my Amateur Radio Operators License and later a Commercial Operators License. Employment in the communications and computer industry followed. Collecting antique radio equipment was the logical thing to do. At least I thought it was.

My collecting started with some rather ordinary wooden sets, table and floor models, but I soon realized that because of size restrictions and display area I couldn't fit a lot of these sets into the area allowed. My interest then turned to crystal sets. These were basically smaller and would fit into my available space much better. At last count I have about seventy-five sets, both American and British.

One of the most unusual crystal sets in my collection is a British set made by Clydelco of Glasgow, Scotland. It is a cylindrical set with lucite see-through sides and a lucite variometer. The top and base are hard rubber with dual crystal detectors on top.

After a while I thought a change of pace was in order. I was getting a little burned out on crystal sets. Nancy and I started to look for and collect colorful plastic sets. You might say, "What else is new?" as a lot of people, even those who don't know anything about the workings of a radio, are collecting them. Is it a fad? I don't know, but I enjoy repairing and polishing them for display.

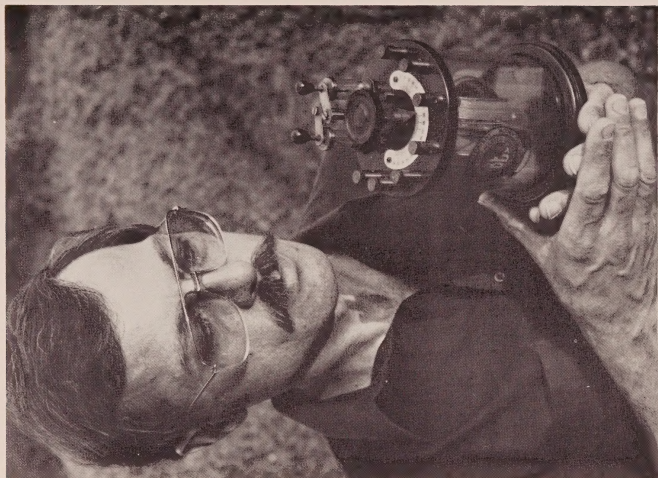
Prices are going out of sight for the better Catalin sets but some stories can be told about that \$22.00 Catalin set found in a local Escondido antique mall, or that \$7.50 set that was supposed to be priced at \$750.00 by some unlucky sales clerk!

At last count we have about 100 plastic/Catalin sets on shelves in one room. What other sort of radio is collectable? The "antique transistor radio" of course! Nancy and I have been collecting these about a year or so now and have about 150 sets. The sets we collect are character or premium types, not the standard square style of transistor radio that comes to mind. These radios are fun to collect because the price is low and the variety seems to be unending. One of my favorite sets is a circa 1962 wooden black lacquer grand piano made by Franklin (Japan). The radio operates when the piano top is raised.

A book is now being written about character and promotional transistor radios. I am sure there are other collectors of transistor sets eager to buy it when it becomes available. Probably by that time transistor radios will be in the \$100 to \$200 range!! and we will have to think of something else to collect. How about "antique citizens band radios" or "antique personal computers"? Happy collecting.



Plastic Radios





Parking lot action



Contest Chairpersons ---- Roy and Kathryn Tucker



February Business and Program Meeting



Instruments and Measurements



AUDIO OSCILLATORS AND DISTORTION ANALYZERS

BY ED SHELTON

Audio oscillators and distortion analyzers are not only used together but they use common circuits, as will be pointed out in the text of this three part series of articles. Part I will mainly be concerned with the history and development of the audio oscillator up to 1937-1938, when the R-C oscillator circuit was introduced by General Radio. Part II will discuss the R-C oscillators made by General Radio, Hewlett Packard and others. Part III will discuss the distortion analyzer and how the circuit design of this device is related to the R-C oscillator.

Throughout this series we will see how the design of these instruments was influenced by developments in speakers, sound movies (1929) and high fidelity radios. If there is a reader interest we could (later on) spend some time on component and radio receiver test procedures used during this era.

PART I

Audio Oscillators to 1937

In the beginning there were no requirements for audio oscillators other than for AC bridge measurements with the possible exception of uses in the telephone or university laboratories. Buzzers served the purposes very well as an AC generator for bridge measurements of L and C. Soon, in order to get better wave form, tuning forks were also used. At first these had make or break contacts to energize the driver

coil much like a door bell or buzzer is operated. Then, borrowing from the telephone, a microphone button was used in place of the make or break contacts. This "audio oscillator" has a long history. They were useful as timing devices and audio sources in the physics lab when I was in college in the 1930's. They are listed in my 1956 GR catalog, and probably beyond that. A further refinement was the vacuum tube driven tuning fork. That was an important frequency standard in its day. The tuning fork was used in watches recently until replaced by quartz crystals (see Fig. 1 & Fig. 2).

In the early days of radio (1920's) distortion was a major concern. What was called distortion in those days we now call frequency response. Today, and by the mid-1930's, when we referred to distortion we meant non-linear or harmonic distortion. But most of the advertising hype of the 1920's period was directed at the ability of a manufacturer's set to get distant stations or its freedom from (frequency) distortion. The less said about what actually came out of the speaker, the better.

Gradually the user public began to expect more from their radios than just getting distant stations. I think the introduction of sound in the motion pictures in 1929 had a lot to do with stimulating the public interest in good sound. The 1928 to 1931 period marks a major turning

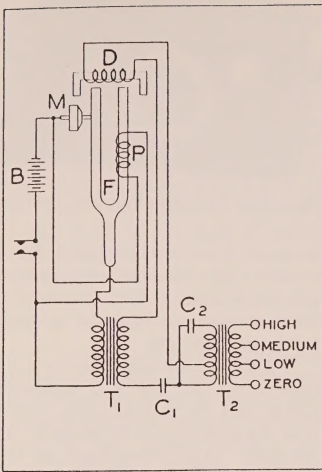


Fig. 1. Single-button, microphone-driven fork.

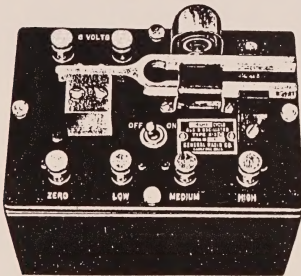


Fig. 2. Type 213-C Audio Oscillator

point in radio design due to several significant developments:

1. The electrodynamic speaker, which had been around for a long time, came into general use.
2. Good "high powered" low plate voltage audio tubes such as type 45 became available.
3. The superheterodyne was improved and essentially re-introduced.

The superheterodyne made the use of the band pass filter (in the IF amplifier) practical. Although the TRF lingered for a while and some of the better sets used band pass RF stages, they could not compete with the superheterodyne in reducing sideband cutting (i.e. a loss of high notes). By the mid-1930's band expanding IF stages were introduced. The 1934 Philco 200X is an outstanding set from this period, with many "high fidelity" features.

4. The linear diode detector arrived, which replaced the high-distortion square law detectors used previously.

5. The use of screen grid pentode and remote cut-off tubes, which reduced RF distortion.

6. Improvements in speaker and cabinet design.

7. The invention of negative feedback in the late 1920's by Harold Black. This patent was issued in 1934 and its principles were soon widely applied.

8. The development of AC tubes and the AC set was the major advance that made many of the above improvements possible.

In order to test audio transformers, speakers, audio systems and radio sets, audio oscillators needed to have a means of varying the frequency either continuously or in small discrete steps. Tuning forks just couldn't do the job. L-C oscillators were built and used in the 1920's but they required elaborate switching systems to change frequency. At audio frequencies large inductances and capacitors were needed for tuning. It is extremely difficult at these frequencies to get high Q (efficient) L/C circuits. This made the instruments large, heavy, and difficult to use.

In the mid-1920's RCA and General Radio worked on the solution to this problem, which was the development of the beat frequency oscillator. By 1927-1929 both General Radio and RCA were building some very fine Beat Frequency Oscillators. Other manufacturers, such as Supreme and Clough-Brenge, also made them. The beat frequency oscillator worked by having a fixed, stable, oscillator, usually about 140 KC and a variable oscillator with a range from 120 to 140 KC. The beat between this combination of frequencies gave a useful working range of 20 to 20,000 cycles. The BFO became the standard oscillator for many years. It is well designed, it is stable, has low distortion, has a low hum level, and it will cover a wide range of frequencies without switching. It is the preferred instrument for many types of audio work, particularly when swept frequency recorded response data of speaker and audio amplifiers is desired, or when range switching transients cannot be tolerated. You can refer to the *GR Experimenter* of November 1953 for a detailed comparison of the R-C oscillator vs the BFO type. The *GR Experimenter* of June 1954 has a good description of the GR Type 1304B, which was the ultimate in beat frequency oscillators. The GR Type 613A BFO, pictured in Fig. 3, is a good early example of this type of oscillator. It was introduced in 1932.

Further development at GR resulted in the R-C oscillator. Basic patents were issued to GR in 1937. With the R-C oscillator a ten to one tuning range is quite feasible, but a switching system is required to cover the whole audio range. Ranges of 20-200, 200-2,000, 2,000-20,000 cycles are typical for this type of oscillator.

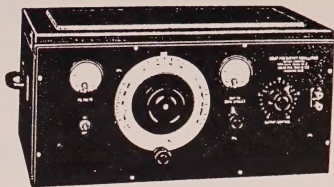


Fig. 3. Type 613-A Beat Frequency Oscillator

Because it is usually tuned by a variable air capacitor, impedances are quite high at low frequencies. Good shielding is essential to keep the hum level low.

Those who are interested in more information on the R-C oscillator circuit and its related uses should read the article by H. H. Scott in the February 1938 *Proceedings of the Institute of Radio Engineers*, page 226, "A New Type of Selective Circuit and Some Applications." The R-C oscillator was very popular and saw a lot of use during World War II. It was built by Hewlett Packard and many other companies, as well as General Radio.

OUR MISTEAKS...

If you find mistakes in this publications, please be assured that they are put there for a purpose. We try to please everyone and some people are always looking for mistakes. To those who revel over slips in comas and occasional poor proof reading and ommissions, enjoy them!!!

Submitted by Phyllis Sheldon
From the *Golden Gardens*
magazine

PARKING

Swap meets are growing in size. At Burbank parking is limited so we are asking buyers to park out on the street. Sellers should occupy one spot unless you have a van with many things to sell. Please, vans, use only two spots.

Restoration Tips



— Edited by Joseph C. Smolski

Loose veneer can usually be reglued but getting the right amount of glue far enough under small patches of lifted veneer can be tricky. Your local pharmacy may just have the "tool" you need. A disposable syringe fitted with a large precision needle can be used to inject wood-worker's glue just where it is needed. At less than half a buck it's probably the best tool bargain on the market!

If you get stuck for a replacement push-pull output transformer you can sometimes make do with a pair of single-end transformers, provided they are the same. Connect the primary windings in series, using the common connection as the center tap. The secondaries may be connected in parallel or series aiding, depending upon impedance requirements. Be sure to connect the secondaries in phase.

If you are replacing an output transformer which has an open primary, check first to see if another circuit fault caused the transformer to fail. A Howard console with push-pull outputs had an open circuit in one half of the primary. The output tube on that side had a shorted coupling capacitor connected to its control grid. The excess plate current destroyed both the output transformer and the tube.

An extremely loud, intermittent buzz may sometimes be caused by poor contacts at the rectifier tube socket. A Philco Model 80 had this most annoying problem, which was corrected by bending the socket springs at the plate prongs of the type 80 rectifier tube.

If you have a speaker that keeps getting dirt in the voice coil gap (causing a raspy sound), it may not be dirt. If the problem keeps coming back despite periodic cleaning, the speaker may have a rusty pole piece. There is no cure short of taking the speaker apart and replating or refinishing the pole piece to keep the rust from coming back.

Some push-pull output stages had driver transformers with two secondaries. These two windings provided the necessary phase inversion and drive to the output tube control grids. If you are looking for one of these hard-to-get transformers, you may find one in an old Wollensak reel-to-reel tape recorder. Look for models T-1500, T-1515, T-1700 and TS-1320 at scrap yards and garage sales. Thanks to Ray Larson for this tip.

A previous issue carried an article about a Silver Marshall Shielded Six. Since then a reader has provided more information on the subject. According to a S-M catalog dated March 15, 1928, a model 630SG kit with type 222 screen grid tubes was offered for \$97. *Radio News* for February 1928 carried an ad for this receiver. Since S-M sold the parts individually as well as in kits, it seems that there is a good chance that some earlier (pre-1928) model 630's (with triode RF's instead of tetrodes) were modified to use the improved type 222 screen grid tubes. Thanks to Alan Douglas of Massachusetts for copies from *Radio News* and the 1928 S-M catalog.

Cont. on page 20

BUILD YOUR OWN A, B, C ELIMINATOR FOR HALF THE COST OF A COMMERCIAL UNIT

By Joseph C. Smolski

If you are satisfied with "static displays" (equipment that looks nice, but doesn't work), this article may not be of very much interest to you. If you're like me, on the other hand, you like all your gear to be completely functional.

Until now, commercial power supplies for battery operated sets could easily cost upwards of \$80. This article describes an excellent, fully regulated battery eliminator you can build yourself for less than half of that price.

One of the ways this supply keeps a lid on cost is with simplified design. A single, inexpensive transformer powers the entire eliminator, and all five of the fixed "B" outputs are driven by one regulator circuit. The "A" output is regulated by an integrated circuit, and the "C" supply uses a single zener diode, all of which makes for a reduced parts count and easier construction. Best of all, the design calls for readily available parts that won't cost you an arm and a leg.

Circuit Description

The "A" or filament supply is continuously adjustable from 1.5 to 7.5 volts at any current up to 1.5 amperes. It uses a single high performance, variable IC regulator which must be adequately heat-sinked. The regulator has internal overload protection and thermal shutdown for safety and reliability.

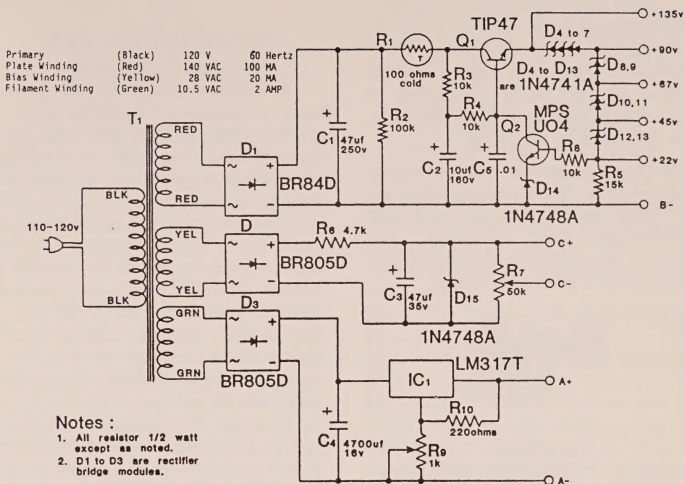
The "B" or plate outputs can supply up to a combined total of 50 milliamperes, at 22, 45, 67, 90, and/or 135 volts. This section of the supply uses a two transistor regulator and a string of zener diodes that divide the output voltage. Q1 in the

accompanying schematic diagram is a series pass transistor whose collector-to-emitter voltage changes to maintain a constant output potential, regardless of line voltage or load current.

Q1 gets its base current through R3 and R4, which also furnish collector current to Q2. In operation, if the output voltage as sensed at the base of Q2 tries to rise, Q2 is turned on harder, drawing more current through R3 and R4. The resulting increase in the voltage dropped across R3 and R4 lowers the base voltage at Q1, correcting the output voltage. Conversely, if the output voltage as sensed at the base of Q2 tries to fall, Q2 is moved closer to cutoff, drawing less collector current through R3 and R4. The consequent reduction in the voltage dropped across R3 and R4 tends to increase the voltage appearing at the base of Q1, correcting the output voltage. The thermistor in series with the collector load of Q1 has a positive temperature coefficient and protects the B regulator against overload. This device has a cold resistance of about 100 ohms. Excess current heats the thermistor, which causes its resistance to increase, limiting current to a safe level.

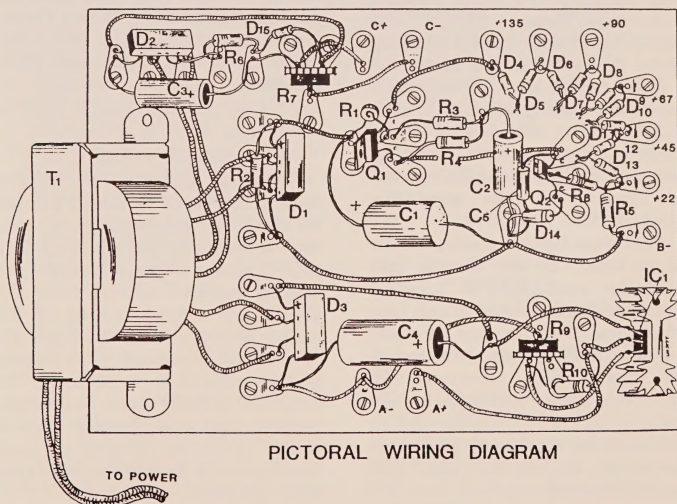
The "C" or bias supply is not called upon to deliver any significant current under normal conditions. Accordingly, it is a simple zener regulator circuit with an output continuously adjustable from 0 to 22 volts. It uses a variable resistive voltage divider at the output. The C+ output can be strapped to the B-output for circuits requiring a negative bias supply.

Cont. on page 20



SCHEMATIC DIAGRAM

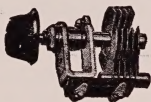
Design change from previous article adds C5 and R8 (Improved overload stability characteristics).



PICTORIAL WIRING DIAGRAM

Parts are available from Antique Electronic Supply, 688 W. First St. Tempe, AZ 85281. Telephone (602) 894-9503. They can supply a complete kit of parts, including a breadboard and a drilling template, for \$39.95 plus shipping.

The previous article was originally published in the December 1985 issue of Radio Age (\$11.00 per year, 636 Cambridge Road, Augusta, GA 30909). We are reprinting courtesy of Donald O. Patterson, Editor.



ANNUAL SCARS DIRECTOR'S MEETING

January 16, 1988

Solana Beach, Calif.

In attendance were Mike Adams, Bruce McCalley, Bill Wakefield, Mary Curry, Floyd Paul, Morgan McMahon, Walter Curry, Joe Knight, Alan Smith and Ed Sheldon. George A. Fathauer was absent.

Mike Adams kept the meeting's discussions moving briskly. A budget, first vs third class mailing (of the *Gazette*), potential new meeting sites, and many other topics were on the agenda. Of note were the following:

First class *Gazette* mailing status will be kept. The new *Gazette* look would be continued. A museum committee was appointed to look into approaches, concepts, and to then attempt to develop a plan of action. A new membership brochure and application blank was to be developed.

The cross section of people in attendance represented the club membership well.

Ed. F.P.

Cont.

RESTORATION TIPS

By Joseph C. Smolski

A number of pre WW-II Silver-tone pushbutton receivers had a rubber friction drive part that was shaped like a doughnut or a rubber tire. When it goes bad the manual tuning mechanism slips. A good replacement part for at least some models can be had for about a dollar at your local Singer Sewing Machine repair shop. Older Singers used a nearly identical rubber doughnut in the bobbin winder. Singer still makes these in several sizes so there is a good chance of finding one to fit your old Silvertone.

Howard W. Sams & Company will make copies of information in its files for a nominal fee. Sams maintains files of manufacturers data back to the early 1920's and also keeps a complete file of all out-of-print Photofact publications. They charge \$1.00 per page, plus \$2.50 for postage and handling. Write Photofact Tech Services, P.O. Box 7092, Indianapolis, IN 46206 or call (307) 298-5565.

AUTO RADIO FIELD COILS

Dynamic speakers from pre-war auto radios cannot ordinarily be used for repair or replacement in AC sets, even though they look identical. The field windings in these speakers are usually operated directly from the six-volt car battery instead of the radio's B+ supply. The field coils are of very low resistance — ordinarily twenty ohms or so — instead of the usual 500 to 2,000 ohms. In addition, because they are operated from a source of direct current, no hum bucking coil is provided in these auto radio speakers.

MINUTES

SCARS MEETING

February 20, 1988

By Ed Sheldon, Sec.

The meeting was called to order at 10:45 A.M. by Mike Adams, President. Paul Bourbin, president of CHRS, 25 Greenview Court, San Francisco, CA 94131, announced several meetings planned by CHRS: Swap Meet, March 26 in San Luis Obispo; in Concord in April; and San Francisco in July. Contact Paul if you wish more information.

The SCARS May 21 meeting will be held at LERC in Burbank. There will be a catered luncheon and an auction (luncheon is \$5.50). The SCARS November meeting may be two days long. A location near the beach area is being sought.

Alan Smith, historian, brought the SCARS history book for display for members to see. If you have any material for this book contact Alan.

Mary Curry, treasurer, gave a report indicating that the club is solvent. She presented a budget for 1988 based upon 650 members and 85 associate members. Members present voted to approve the budget.

Ed Sheldon asked for approval of previous meeting minutes as published in the February 1988 *Gazette*. So moved, seconded, and passed. A list of forty one applicants for membership in SCARS was presented and voted into membership. Walter Curry and Morgan McMahon passed out a new membership application blank. Mike Adams, Morgan McMahon and Floyd Paul described their efforts and thoughts regarding the museum planning efforts under way.

The meeting was adjourned at 11:15 A.M. Walt Curry then gave an interesting talk on plastic and transistor radios. Roy and Kathryn

Tucker, contest chairpersons, presented the results of the contest and gave awards.

CONTEST RESULTS

February 1988 Meeting

By Roy & Kathryn Tucker
Contest Chairpersons

CATEGORY I — Radio equipment of any type made outside the United States prior to 1942.

1st. Wat Panutai, 1941 English Defendant receiver

2nd. Wat Panutai, English Phillips receiver

3rd. Wat Panutai, 1940 His Master's Voice receiver

CATEGORY III — Homebrew or replica equipment of any type representing any period prior to 1942.

1st. Oran Boudreau, One Tube, 1920's replica (and Best of Show)

2nd. Wat Panutai, Victory homebrew tombstone

3rd. Wat Panutai, Swiss cathedral replica

CATEGORY IVA — Cathedral or tombstone receivers, early 1930's.

1st. John Hayes, Philco 16

2nd. Larry Kenan, Philco 20

3rd. Elliot Baumbach, Philco 90

CATEGORY IVB — Cathedral or Tombstone, middle 1930's.

1st. Oral Boudreau, GE/RCA Home-/Auto

2nd. Larry Kenan, 1935 Emerson receiver

3rd. Oral Boudreau, Sparton 537X

OPEN CATEGORY

1st. Wat Panutai, English wireless literature

2nd. James Beamon, Philco Predicta TV set

NON-JUDGED

EDUCATIONAL CATEGORY

Paul Giganti, Marconiphone 1922 broadcast receiver

Roy and Kathryn Tucker, Modern plastic antenna insulators

CATEGORIES for JUDGING

May 1988 Meeting

Category I—Any type of equipment or display related to television or facsimile.

Category II—Receivers with plastic cases of unusual character.

Category III—Loudspeakers and microphones of any vintage.

Category IV—Any type of battery operated radio equipment.

As usual, any item that is not appropriate for a named category will be entered in Open Category, and any item not desired for judging can be labeled as a non-judged (educational) exhibit.

MUSEUM TOUR

By F. Paul

Morgan McMahon and the editor visited the Pacific Pioneer Broadcasters (PPB) during the last week of February. Norman Dewes, SCARS and PPB member, hosted us.

The PPB, which has had participating members such as Edgar Bergen, Ralph Edwards, Art Gilmore, Lenore Kingston, Ernest Borgnine and many other celebrities, is located in the basement of the Home Savings and Loan building at Sunset and Vine in downtown Hollywood.

Morgan and I saw old tape recorders, microphones, radio scripts, sixteen-inch disks (by the thousands), radios, and much more broadcasting memorabilia.

Nostalgia of old Hollywood exists in these basement rooms where a club room allows members to relive old radio programs. Individual SCARS members may call the Clubroom Technician, Mr. Ron Wolf, at (213) 462-9609 and request a tour. Currently, Mondays are the best day to visit the studio and museum.

REPRINTS OF HISTORICAL BOOKS AND PAPERS NOW AVAILABLE FROM ANTIQUE RADIO CLASSIFIED

During the 1970s, the Arno Press reprinted over 75 early books on the history of telecommunications. A.R.C. has made arrangements to distribute those still available. Although they are not inexpensive, mainly because their specialized nature and low press run, most books are still priced less than a hard-to-find original copy. Here is a convenient way to obtain a quality hardbound reprint copy of these historic books and documents.

Reprinted Books

- Archer, Gleason L. *Big Business and Radio*. The growth of radio from about 1922 to 1938. 1939.\$36.50
Blake, George C. *History of Radio Telegraphy and Telephony*. Technical detail and 51-page bibliography. 1928.\$35.50
Bright, Charles. *Submarine Telegraphs: Their History, Const. and Working*. 1898. ..\$57.50
Dunlap, Orrin E., Jr., *Radio's 100 Men of Science*. Biographical narratives of men in electronics and television. 1944.\$25.00
Fahie, J.J. *A History of Wireless Telegraphy*. A technical history of wireless telegraphy up to 1872. 1901.\$30.00
Fahie, J.J. *A History of Electric Telegraphy to the year 1837*. 1884.\$38.50
Harlow, Alvin. *Old Wires and New Waves: The History of the Telegraph, Telephone and Wire- less*. 1936.\$36.00

Original Anthologies

- Development of Submarine Cable Communication*. 50+ articles, reports, book excerpts, etc. 1863 to 1971. 2-Vols. 1980.\$71.50
Early American Telegraphy. Three papers by Alfred and J. Cummings Vail. 1845 to 1914. 1 Vol. 1974.\$25.50
Military Signal Communications. 50+ articles, reports, book excerpts, etc. 1861 to 1965. 2-Vols. 1980.\$71.50
Signalling and Communicating at Sea. 50+ articles, reports, book excerpts, etc. 1863 to 1969. 2-Vols. 1980.\$73.00
The Electric Telegraph. 18 book excerpts, articles, etc. 1859 to 1962. 1-Vol. 1977. \$54.00

Out of Print - Advance Orders Only

Lodge, *Signalling through Space Without Wires*
Archer, *History of Radio to 1920*

Send payment with order.

Mass. residents add 5% tax.

SASE for full list or details on any book(s).

Add \$1.50 per order for shipping in U.S.

Allow 4 to 6 weeks to receive books.

Antique Radio Classified

P.O. Box 2, Carlisle, MA 01741

SCARS ANNUAL MAY AUCTION

By Walter Curry

A good time was had by all at last year's successful auction, spiced by the amusing repartee of auctioneer Mike Adams. This year's auction again looks like it will be a good one. Donations are always welcome. Several interesting items have already been donated to the club for auction, including a Stephens TRU-SONIC microphone and an English resistance bridge (donated by Don Dresden), a Bendix shielded loop antenna, and a rare Hallicrafters Ultra Sky-rider receiver (donated by the Charles Busenkell estate through the efforts of Ralph Lamm). So bring all that equipment you can live without and convert it into cash without any selling hassles.

AUCTION RULES

1. Buyers and sellers must be club members.
2. Six items maximum per seller.
3. 10% to SCARS if sold. No penalty if not sold.
4. Absentee members may bid through a member in attendance.
5. Bid numbers \$1.00, refundable to winning bidders.
6. Very heavy or large items will require approval by auctioneer.
7. \$1.00 minimum bid steps.
8. Seller must pick up tags and attach to equipment, with description, and state minimum bid if desired. Auction items must be in and tagged by 11:45 A.M.
9. Buyer and seller report to cashier *at end of auction*. Buyer pays seller, seller pays SCARS 10%. Pickup items within one-half hour after auction closes. SCARS assumes no responsibility for items after this time.

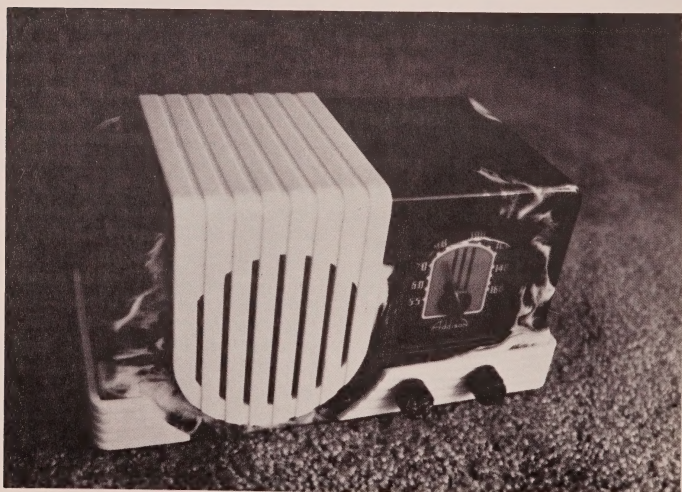
10. SCARS allows minimum bids to be specified. However, sellers should keep them low or bidding may not start. (Note: I have seen many cases where a unit with no minimum bid would be bid up right through the minimum of an identical unit that couldn't get started and was passed.)

NEW MEMBERS February 20, 1988

Aikens, Daniel
Beaman, Bob
Blubaugh, Diane & Doug
Bowers, Chris
Buckner, William
Buzzell, Parker
Clark, Jim
Dawson, John
DeHenseler, Dr. Max
Donham, Kenneth & Loretta
Donahue, Frank
Fox, Arthur
Fuller, James
Goad, Robert
Groesser, J.B.
Hall, Norman
Hammond, Edward
Handler, Tony
Herp, Harold
Johnson, Arthur
Johnson, David
Kashiwada, Minuru
LaPatka, Larry
John, E.E.
McKarus, Douglas
Montano, Hank
Mullins, W.S.
Parkhurst, Larry
Patterson, Larry
Patris, Michael
Quella, Dan
Rosario, Peter
Sabue, Ron
Sandbach, Norman
Schultz, Richard & Arlene
Snyder, Edward
Stevens, George
Squires, Paul
Wada, Hidetoshi
Walker, Robert
Zeps, Herman



Walt Curry collection, pictures by Mike Adams





For Sale or Trade & Want Ads



ADS MUST BE SUBMITTED EACH TIME FOR EACH PUBLICATION AND ARE FOR PERSONAL USE ONLY. SCARS WILL NOT PRINT REPETITIOUS ADS. ALL ADS ARE SUBJECT TO EDITING. SCARS IS NOT RESPONSIBLE FOR ANY TRANSACTION OR THE CONDITION OF ITEMS ADVERTISED.

FOR SALE or Trade: Philco Radio Bar, Philco floor model (Bel Geddes design), and Zenith chairside, all in good condition. Will trade for Philco cathedrals, catlins, or novelty sets. Sinee Levin. 3040 Lake Glen Drive. Beverly Hills, CA 90210. (213) 205-8914.

FOR SALE: 1967 ARRL Handbook, \$5. 1940 *Radio Handbook*, 7th edition, \$5. 1918 Nat. Bu. Stds. circular #74, \$10. \$1.00 shipping per book. F. A. Everest. 6275 S. Roundhill Drive. Whittier, CA 90601.

✓ FOR SALE: Liquidating entire collection of over 300 radios, spark equipment, crystal sets, and over 1000 tubes, tubular Audions, spherical Audions, many early types. Ralph Earnstein. 18934 Celtic St. Northridge, CA 91326. (818) 363-3078. No shipping.

FOR SALE: Two batches of tubes. One batch has 5Y3, 76, 58, 6D6, 24A, 41, 42, 27, 26, 39/44, 80...about 20 tubes. \$8.50 plus shipping. Another batch has above plus 46, 47, 71A, 112A, and 30...about 40 tubes, \$20 plus shipping. Also have two '50 tubes and reprinted Riders Vol. 1. F. A. Paul. 1545 Raymond Ave. Glendale, CA 91201. (818) 242-8961.

WANTED: One (1) Tone-Beam tube for Atwater Kent model 612 console. Words "Duovac" and "Tune-A-Lite" printed on tube base. Sam Wrenn. 2314 Seminole, #1207. Arlington, TX 76010.

WANTED: AK type 11 tuner and other breadboard parts. Knob and restorable cabinet for Kennedy V. Information and chassis or tuning capacitors for Deitrickson model 5RF radio. Information on Hartman Radio Company of Atchison, Kansas. Bob Nicholson. 3423 S. Long. Topeka, KS 66605.

WANTED: Buy or trade.... 73 (Journal of SW Div ARRL) 1930's issues. Amateur Radio News. R/9 1933 and earlier. The Oscillator. Listening In. Other early LA area magazines. Have some of the above to trade. Jim Maxwell. W6CF. P.O. Box 473. Redwood Estates, CA 95044. (408) 353-2094.

WANTED: Need a receiving tube manual or xerox showing last tubes used in TV sets in the '70's. Ray Larson. 12241-1/2 Gorham Ave. West Los Angeles, CA 90049.

WANTED: Instruction manual for Heath model I-M-12 Harmonic Distortion Meter. Good copy OK. Ed Sheldon. 656 Gravilla Place. La Jolla, CA 92037.

WANTED: Remler parts, sets, literature. Will reimburse set owners for photos from their Remler collection. Rick Ferranti. 254 Florence Ave. Arlington, MA 02174. (617) 646-6343.

HELP! Paul Thompson wants to contact Martin Polb. Anyone knowing of Martin's address please call or write Paul Thompson. 315 Larkspur Drive. Santa Maria, CA 93455.

**PUT
POWER
BEHIND YOUR
SIGNALS
with these RCA
Rectifiers!**



**RCA-866
\$1.50**

ANNOUNCEMENTS

MAY LUNCHEON

A gourmet basket lunch is being planned for the May meeting. The lunch will be made available around noon before the auction is held. The luncheon will consist of an excellent sandwich, a salad, and a beverage. The cost will be \$5.50 per person.

All luncheon orders must be received by Mary Curry by May 14. **Please mail in luncheon orders now!** See Mary's address on the inside front cover of this *Gazette*.

BOOK REVIEW

Ray Kelly has put together a notebook of 1920's type loudspeakers for the Historical Radio Society of Australia. The cone and horn speakers in this notebook represent products made outside the U.S. Such manufacturing names as Amplion, Burndept, Edison Bell, Philips, and Telefunken are but a few of the familiar names represented in the fifty-page notebook.

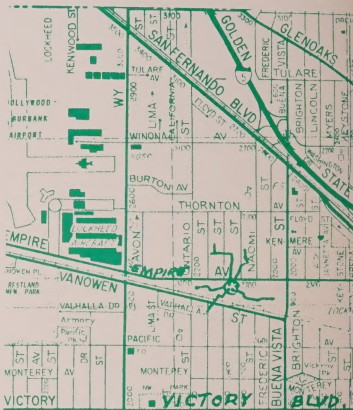
An index allows the reader to locate where a horn or cone speaker advertisement is located. Over 200 speakers are shown or referenced. Collectors (or historians) of foreign cone and horn speakers will find this a nice reference item.

Write: Ray Kelly, 49 Sharon Road, Springvale 3172, Victoria, Australia. Send a check for \$15.90 (Australian) which is about \$11.50 U.S.

JACKSON-BELL: Want information about Jackson-Bell for upcoming story. Pictures of cathedrals, historical information, etc. Write or call Floyd A. Paul.

1988 MEETINGS

The four quarterly SCARS meetings are planned for the third Saturdays of February, May, August and November. The February, May and August meetings are planned for the Burbank location (Lockheed Employees Recreation Club, 2814 Empire Ave. Burbank). The November meeting is planned for the Velvet Turtle Restaurant in Torrance, California. Put these dates on your calendar.



GAZETTE DEADLINES

All ads, material and articles for *SCARS Gazette*:

February issue December 1
May issue March 1
August issue June 1
November issue September 1

IN MEMORY OF:

H. Lincoln (Chad) Chadourne of La Jolla passed away January 17, 1988 after an extended illness. Chad will be remembered by many of the SCARS members.